Japanese Patent Application 11-264630 (9/17/1999)
Japanese Patent Publication 2001-084705,A (3/30/2001)

Applicant : SONY CORP
Inventor : YAMADA MAKOTO, TSUJII SATOSHI, ISHIZAKA TOSHIYA

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the recorder which performs record of picture image data and/or audio information, a record method, and a disk shape recording medium.
[0002]
[Description of the Prior Art]For example, in the recorder which records picture image data and/or audio information, such as a camcorder, the data which picturizes and/or records some scenes is recorded for every file. The recording and reproducing device which also has the function to reproduce and edit the recorded data is known by adding sound generation parts, such as indicators, such as a liquid crystal display panel, and a loudspeaker, to such a recorder, for example. In such a recording and reproducing device, when using especially the recording medium in which random access, such as a magneto-optical disc, is possible, and a user etc. specify a file, it is possible to choose desired data as an object of playback and edit.
[0003]
[Problem(s) to be Solved by the Invention]In this case, a file is specified by generally inputting a file name etc. However, when many files are recorded, there is a possibility that the thing operativity in reproduction, edit, etc. may be spoiled by the factor of being unable to memorize the file name etc. of the file for which a user etc. ask.
[0004]Therefore, the purpose of this invention is related with the recorder which can raise operativity, a record method, and a disk shape recording medium.
[0005]
[Means for Solving the Problem]In a digital recording device with which an invention of claim 1 uses a disk shape recording medium, Extracted extract information concerning each of two or more files recorded on a disk shape recording medium is extracted, By generating an index file and recording a generated index file on a prescribed position of a disk shape recording medium by relating extracted extracted extract information with each of two or more data, and storing it, It is a recorder characterized by facing performing predetermined operational mode and making it output two or more kinds of data recorded on a disk shape recording medium in a fixed form.
[0006]In a record method in a digital recording device with which an invention of claim 19 uses a disk shape recording medium,Extracted extract information concerning each of two or more

files recorded on a disk shape recording medium is extracted, By generating an index file and recording a generated index file on a prescribed position of a disk shape recording medium by relating extracted extracted extract information with each of two or more data, and storing it, It is a record method characterized by facing performing operational mode including reproduction motion, and making it output two or more kinds of data recorded on a disk shape recording medium in a fixed form.

[0007]An invention of claim 20 is a disk shape recording medium with which it comes to record an index file generated by relating with each of two or more data extracted extract information concerning each of two or more files which self is recording, and storing it on a prescribed position in a disk shape recording medium.

[0008]According to the above inventions, extracted extract information concerning each of two or more files recorded on a disk shape recording medium is made to output, and desired data can be easily searched in relation to extracted extract information.

[0009]

[Embodiment of the Invention]Drawing 1 shows an example of the composition of the digital recording playback equipment in one embodiment of this invention. In drawing 1, 1 shows a video encoder. The video signal generated when image pick-up light is supplied to the image sensor of CCD (Charge Coupled Device) etc. by the optical system which is not illustrated is supplied to the video encoder 1, and compression encoding of the video signal is carried out in the video encoder 1. 2 shows an audio encoder. The audio signal generated by audio signal generation parts, such as a microphone, is supplied to the audio encoder 2, and compression encoding of the audio signal is carried out in the audio encoder 2. As compression encoding to a video signal and an audio signal, MPEG is used, for example. Each output of the video encoder 1 and the audio encoder 2 is called elementalist ream.

[0010]The motion prediction part from which the video encoder 1 detects a motion vector in the case of MPEG, A picture order rearrangement part, the subtraction part which forms the prediction error between an inputted video signal and a local decoding video signal, It comprises a DCT section which carries out DCT transformation of the subtraction output, a quantizing part which quantizes the output of a DCT section, a variable length coding section which carries out variable length coding of the quantization output, and a buffer memory which outputs coding data at a fixed rate. A picture order rearrangement part rearranges an order of a picture into a thing suitable for coding processing. That is, a picture is rearranged into an order suitable for coding I and P picture previously and coding B picture after that. A local decoding part comprises an inverse quantization part, a reverse DCT section, an adder unit, a frame memory, and a motion compensation section. In the motion compensation section, forward direction prediction, opposite direction prediction, and both-directions prediction are enabled. A subtraction part does not perform subtraction treatment but, in the case of intra coding, data only passes it. The audio <DPN=0004encoder 2 comprises a sub band coding section, an adaptive-quantization bit assignment part, etc.

[0011]As an example, the picture photoed with the video camera is made into input video, and, in the case of disk recording playback equipment, really [carried type camera] let the sound collected with the microphone be an audio input. In the video encoder 1 and the audio encoder 2, an analog signal is changed into a digital signal and processed. In this one embodiment, a rewritable optical disc is used as a recording medium. As this kind of an optical disc, a magneto-optical disc, a phase change type disk, etc. can be used. According to one embodiment, the magneto-optical disc of a byway is used comparatively.

[0012]The output of the video encoder 1 and the audio encoder 2 is supplied to the file generating machine 5. The file generating machine 5 changes the data structure of video elementalist ream and audio elementalist ream so that it may have a file structure which can deal with an animation etc. with the computer software for playing synchronously, without using special hardware. According to this one embodiment, QuickTime is used as software. QuickTime Still pictures including an animation, a text, an audio, It is the software which can treat various data of MIDI (Musical Instrument Digital Interface) etc., and can control those data along with a time-axis. QuickTime is used and the data which stores various data is called a QuickTime movie file.
[0013]In the file generating machine 5, a coding video data and coding audio information multiplex. In order to create the structure of a QuickTime movie file, the file generating machine 5 is controlled by the system control microcomputer 9. The index file concerning this invention is also generated by the file generating machine 5.
[0014]The QuickTime movie file from the file generating machine 5 is written in the memory 7 one by one via the memory controller 8. If the data writing demand on a disk from the system control microcomputer (microcomputer) 9 is inputted to the memory controller 8, a QuickTime movie file will be read from the memory 7 by the memory controller 8. Here, the transfer rate of QuickTime movie coding is lower than the transfer rate of the write data to a disk, for example, is set to two in about 1/. Therefore, to a QuickTime movie file being continuously written in the memory 7, read-out from the memory 7 is intermittently performed, while the system control microcomputer 9 supervises overflow or not carrying out underflow in the memory 7.
[0015]The QuickTime movie file read from the memory 7 via the memory controller 8 is supplied to an error correction code / decoder 11. An error correction code / decoder 11 once writes a QuickTime movie file in the memory 10, processes interleave and generation of the redundant data of an error correction code, and reads the data in which redundant data was added from the memory 10.
[0016]The output of an error correction code / decoder 11 is supplied to the data modulator and demodulator 13. When recording digital data on a disk, the data modulator and demodulator 13 make easy clock extraction at the time of playback, and they modulate data so that a problem like intersymbol interference may not arise. For example, RLL (1, 7) can be used.
[0017]The output of the data modulator and demodulator 13 is supplied to the magnetic-field-modulation driver 14, and the signal for driving the optical pickup 23 is outputted. The magnetic-field-modulation driver 14 drives the magnetic field head 22 according to the inputted signal, and impresses a magnetic field to the optical disc 20. The optical pickup 23 irradiates the optical disc 20 with the laser beam for record. Thus, data is recorded to the optical disc 20. The optical disc 20 rotates by the motor 21 by CLV (constant linear velocity), CAV (each speed regularity), or ZCAV (zone CLV).
[0018]Since the intermittent data read from the memory controller 8 is recorded on the optical disc 20, continuous recording operation is not usually made, but if fixed data volume is recorded, recording operation will be interrupted, and recording operation is intermittently made so that it may stand by till the next recording request.
[0019]According to the demand from the system control microcomputer 9, the drive control microcomputer 12 gives a demand to the servo circuit 15, and control of the whole disk drive is made. Recording operation is made by it. The servo of movement of the disk diameter direction of the optical pickup 23, a tracking servo, and a focus servo are made by the servo circuit 15, and the spindle servo of the motor 21 is made. Although not illustrated, the user's operation input

section is provided in relation to the system control microcomputer 9.
[0020]Next, the composition and operation for reproduction are explained. At the time of playback, the optical disc 20 is irradiated with the laser beam for playback, and the catoptric light from the optical disc 20 is changed into a regenerative signal by the detector under optical pickup 23. In this case, a tracking error and a focal error are detected from the output signal of the detector of the optical pickup 23, a reading laser beam is located on a track, and it is controlled by the servo circuit 15 to focus on a track. In order to play the data of the position of the request on the optical disc 20, movement of the diameter direction of the optical pickup 23 is controlled.
[0021]At the time of playback, like the time of record, it is higher than the transmission laser of a QuickTime movie file, for example, data is played from the optical disc 20 at a twice as many rate as this. In this case, continuous reproduction is not usually performed, but if fixed data volume is reproduced, reproduction motion will be interrupted, and intermittent reproduction motion which stands by till the next reproduction request is made. Like recording operation, according to the demand from the system control microcomputer 9, the drive control microcomputer 12 gives a demand to the servo circuit 15, and control of the whole disk drive is made in operation at the time of reproduction.
[0022]The regenerative signal from the optical pickup 23 is inputted into the data modulator and demodulator 13, and recovery processing is made. The data after a recovery is supplied to an error correction code / decoder 11. In an error correction code / decoder 11, regenerative data is once written in the memory 10, and DEINTA reeve processing and error correction processing are made. The QuickTime movie file after an error correction is written in the memory 7 via the memory controller 8.
[0023]The QuickTime movie file written in the memory 7 is outputted to the file decoder 6 according to the timing of a synchronization which solves multiplexing according to the demand of the system control microcomputer 9. In order that the system control microcomputer 9 may carry out continuous reproduction of a video signal and the audio signal, supervising the data volume which reads from the data volume and the memory 7 which are played from the optical disc 20 and written in the memory 7, and is outputted to the file decoder 6 -- the memory 7 -- overflow -- or so that underflow may not be carried out, The memory controller 8 and the drive control microcomputer 12 are controlled, and the data from the optical disc 20 is read.
[0024]It is QuickTime under the control of the system control microcomputer 9 in the file decoder 6. A movie file is disassembled into video elementalist ream and audio elementalist ream. Video elementalist ream is supplied to the video decoder 3, and audio elementalist ream is supplied to the audio decoder 4. The video elementalist ream and audio elementalist ream from the file decoder 6 are outputted so that both may synchronize.
[0025]The video decoder 3 and the audio decoder 4 decode compression encoding, respectively, and generate a video output and an audio output. For example, MPEG is used as compression encoding of a video signal and an audio signal. The video decoder 3 is constituted by the local decoding part which consists of the adder unit, the picture order rearrangement part, frame memory, and motion compensation section adding the output and local decoding output of a buffer memory, a variable length code decoding part, a reverse DCT section, an inverse quantization part, and an inverse quantization part.
[0026]The summing processing in an adder unit is not made, but, in the case of intra coding, data passes an adder unit. The decode data from an adder unit is made an order of the original picture by the picture order rearrangement part. The output of the video decoder 3 is supplied to the indicator (not shown) of LCD (Liquid Crystal Display) etc. An external image display device

may be supplied via an external output terminal. The output of the audio decoder 4 is supplied to sound generation parts (not shown), such as a loudspeaker.An external voice generator may be supplied via an external output terminal.

[0027]Since the optical disc 20 in which data was recorded as having mentioned above can be detached and attached freely, it is renewable by other apparatus. For example, the personal computer which operates with the application software of QuickTime can read the data currently recorded on the optical disc 20, and can play the video and audio information which are recorded with the personal computer. This invention is applicable also to the case where only a video data or audio information is treated.

[0028]An example of the outside of one embodiment of this invention is typically shown in drawing 2. The lens 210 is an object lens which makes an end to an optical system. The display corresponding to a reproduced image and the contents of operation, etc. are performed via the display panel 220. The display panel 220 is constituted including the piezoelectric element etc. with display devices, such as LCD, and is made able [a user etc.] to input reproductive operation by operation of pressing each display portion with the pointing device 230.

[0029]In the disk shape recording medium in which random access is possible, a desired reproduction object can be chosen by inputting a file name etc., for example. However, when many files are recorded, the file name etc. of the file for which a user etc. ask cannot be memorized, and there is a possibility that the convenience in operation of reproduction, edit, etc. may be spoiled as the result. That such a situation should be improved in one embodiment of this invention. As shown in drawing 3, they are the pictures P1-P9 (thumbnail image: called Thumbnail Picture) typical about nine files in the display panel 220. It displays and is made as [refer to / it / in order that a user etc. may choose a desired file]. And a file shall be chosen by operation of pressing the display portion of which screen, for example with the pointing device 230.

[0030]The contents of operation of requests to the selected file, such as reproduction and edit, can be inputted by operation of pressing the indicators 223, 224, 225, 226, and 227 and 228 grades with the pointing device 230. Here, it is supposed that it is possible to carry out [sound / corresponding to the screen selected with the pointing device 230] predetermined time generating for several seconds etc.

[0031]The display 221 is a display which shows operational modes, such as reproduction and edit, or record. The display 222 is a display which shows recordable residual time. The display 229 is a scroll bar and it is made as [display / the screen which cannot be displayed at once / corresponding to making the position of the display 229a go up and down by operation of the pointing device 230 / at any time]. Also when many screens are recorded by this, for example rather than the number of screens which can be displayed at once, such as nine etc. pieces, those screens can be displayed at any time.

[0032]As a method for supposing that it is possible, search of a file which was mentioned above in one embodiment of this invention. He creates the index file which holds collectively some of image data in two or more files currently recorded on the disk shape recording medium, and/or voice data, and is trying to record the created index file on the prescribed position of a disk shape recording medium. An index file can be created in the form of a QuickTime movie file, for example.

[0033]Hereafter, a QuickTime movie file is explained first. An example treating audio information and image data of a QuickTime movie file is shown in drawing 4. The biggest component part of a QuickTime movie file is with a movie resource portion and a movie data

part. Time required in order to reproduce the file, and the data for referring to the live data are stored in a movie resource portion. Live data, such as video and an audio, are stored in a movie data part.

[0034]A movie resource portion is explained in detail. The movie header 41 which describes the information concerning the whole file, and the track for every kind of data are included in a movie resource portion. Drawing 4 showed an example of an internal structure of the video track 50 in detail. In a video-data track, the track header 42 and media part which describe the information concerning the whole track are contained in a video-data track. A media information department is contained in a media part with the media header 43 which describes the information concerning the whole media, and the media hair drier 44 which describes the information concerning the handling of media data.

[0035]With the media hair drier 45 which describes the information concerning image media in a media information department, the data hair drier 46 which describes the information concerning the handling of image data, and the data information 47 which describes the information about data. The sample table is recorded. Sample desk RIPUSHON which performs description about each sample in a sample table, The sample size 48 which describes the size of the time ****-sample which describes the relation between a sample and a time-axis, and a sample, and the time two chunk which describes the relation between a sample and a chunk, The sink sample etc. which perform the chunk offset 49 which describes the start bit position of the chunk within movie data, and description concerning a synchronization are stored. Here, in Quick Time, the minimum unit (for example, picture in MPEG numerals or data) of data is treated as a sample, and a chunk is defined as an aggregate of a sample. In order to raise the access nature at the time of record reproduction, a continuous sample is stored in a chunk. Although a graphic display is omitted also to the audio track 51, an internal structure similar to an internal structure of a video track is set up.

[0036]The audio information coded by the movie data part, for example with the compression encoding system based on MPEG Audio Layer2 on the other hand, And for example, the image data coded by the compression encoding system according to MPEG (Moving Picture Expert Group) regulation is stored considering the chunk which consists of a sample of a predetermined number, respectively as a unit. However, it is also possible to store the linear data in which a coding mode is not limited to these and compression encoding is not performed.

[0037]Each track in a movie resource portion and the data stored in the movie data part are matched. That is, since an example shown in drawing 3 treats audio information and image data, a video track and an audio track are contained in a movie resource portion, and the live data of audio information and the live data of image data are contained in the movie data part. What is necessary is just to double the contents of the track in a movie resource portion, and the live data in a movie data part with the data which should be treated, in treating the data of other kinds. For example, what is necessary is to make it include the track about a text, MIDI, etc. in a movie resource portion, and just to make it live data, such as a text and MIDI, included in a movie data part, in treating a text, MIDI, etc.

[0038]According to one embodiment of this invention, an index file is created using a QuickTime movie file. In an index file, the data depending on the kind of data treated in the file made into a retrieval object is treated. Here, the file made into a retrieval object explains the file (it is hereafter written as AV file) treating image data and audio information as a premise. In this case, in an index file, four kinds of data, a property, a title, a thumbnail picture, and intro music, are treated. A property is data in which the attribute of each AV file is shown. A title is data in

which the attribute of each AV file is shown. Thumbnail pictures are image data for one typical sheet, such as one in each AV file (for example, the beginning). Intro music is the audio information for several typical seconds, such as several seconds in each AV file (for example, the beginning).

[0039]An example of the index file created using a QuickTime movie file is shown in drawing 5. In this example, the track corresponding to four kinds of data, the property track 62, the title track 63, the thumbnail picture track 64, and the intro music track 65, is included in a movie resource portion with the movie header 61. However, only the property track 62 is an indispensable track and other tracks should just use the thing according to the kind of data treated in an index file. In this example, four kinds of live data, a property, a title, a thumbnail picture, and intro music, are contained in a movie data part. However, only property data are indispensable tracks and other data should just use the thing according to the kind of data treated in an index file.

[0040]An example of the property track 62 is shown in drawing 6. . Defined as a chunk concerning the property data corresponding to each AV information. About each of AV File Property#1, AV FileProperty#2, ..., AV File Property#n. It is considered as data length (for example, variable length displayed per byte) L_AP1, L_AP2, ..., the form of the table that shows L_APn and start byte position 0, L_AP1, and L_AP1+L_AP2 and ...., respectively.

[0041]An example of the property data (live data) for every AV information is shown in drawing 7. 1 byte which makes the 0th byte a start byte position shows version information. It is considered as the flag field which 2 bytes which makes the 1st byte a start byte position mention later. 1 byte which makes the 3rd byte a start byte position shows data types, such as an animation, a still picture, and an audio. 4 bytes which makes the 4th byte a start byte position show the date and time of creation of the AV file concerned. 4 bytes which makes the 8th byte a start byte position show the time at which the AV file concerned was corrected.

[0042]The length of the time for which 4 bytes which makes the 12th byte a start byte position are needed since the AV file concerned is reproduced is shown. Variable-length byte L_FI which makes the 16th byte a start byte position shows the file name of the AV file concerned. Therefore, the total data length of the property data corresponding to each AV file serves as variable-length L_AP1, L_AP2, ..., L_APn, as mentioned above.

[0043]An example of a flag field is shown in drawing 8. The 0th bit is set to 0 when the data entered is a file, and when the data entered is the file group or directory by which grouping was carried out, it is set to 1. It is referred to as 1. The 1st bit is set to 0 when there is no file referred to to AV file, and when there is a file referred to to AV file, it is set to 1. The 2nd bit is set to 0 when the title is not registered, and when the title is registered, it is set to 1. The 3rd bit is set to 0 when the data of a title is in an index file, and when the data of a title is in AV file directed with property data, it is set to 1. The 4th bit is set to 0 when the thumbnail image is not registered into AV file, and when the thumbnail image is registered into AV file, it is set to 1.

[0044]The 5th bit is set to 0 when the data of a thumbnail image is in an index file, and when the data of a thumbnail image is in AV file directed with property data, it is set to 1. The 6th bit is set to 0 when the data of intro music is not registered into AV file, and when the data of intro music is registered into AV file, it is set to 1. The 7th bit is set to 0 when the data of intro music is in AV file, and when the data of intro music is in AV file directed with property data, it is set to 1. The bits from the 8th to the 15th are considered as reserve.

[0045]An example of the title track 63 is shown in drawing 9. According to one embodiment of this invention, it is made as [register / for each / are made into a retrieval object / AV file of

every / a title]. The title registered is stored in a movie data part as live data, and the data length and the starting position of a title for every AV file are shown by the title track. . As a title track was shown in drawing 8, defined as a chunk concerning the title data corresponding to each AV information. About each of AV File Title #1, AV File Title #2, ..., AV File Title #n. It is considered as data length (for example, variable length displayed per byte) L_AT1, L_AT2, ..., the form of the table that shows L_ATn and start byte position 0, L_AT1, and L_AT1+L_AT2 and ...., respectively.

[0046]Next, an example of the thumbnail track 64 is shown in drawing 10. According to one embodiment of this invention, it is made as [register / for each / are made into a retrieval object / AV file of every / one thumbnail image]. The thumbnail image registered is stored in a movie data part as live data, and the data length and the starting position of a thumbnail image for every AV file are shown by the thumbnail track. . The thumbnail track was defined as a chunk concerning the thumbnail data corresponding to each AV information. About each of AV File Thumbnail #1, AV File Thumbnail #2, ..., AV File Thumbnail #n. It is considered as data length (for example, variable length displayed per byte) L_TH1, L_TH2, ..., the form of the table that shows L_THn, start byte position 0, L_TH1, and L_TH1+L_TH2 and ...., respectively.

[0047]An example of the intro music track 65 is shown in drawing 11. According to one embodiment of this invention, it is made as [register / for each / are made into a retrieval object / AV file of every / one introduction part of audio information, such as for example 5 seconds after a head,]. The intro music registered is stored in a movie data part as live data, and the data length and the starting position of intro music for every AV file are shown by the intro music track. . The intro music track was defined as a chunk concerning the intro music corresponding to each AV information. About each of AV File Intro Music #1, AV File Intro Music #2, ..., AV File Intro Music #n. It is considered as data length (for example, variable length displayed per byte) L_IS1, L_IS2, ..., the form of the table that shows L_ISn and start byte position 0, L_IS1, and L_IS1+L_IS2 and ...., respectively.

[0048]Under QuickTime movie file form, the contents of the property track 62 mentioned above, the title track 63, the thumbnail track 64, and the intro MUJIKKU track 65 grade are displayed, as shown in drawing 12. As mentioned above, corresponding to AV file, a sample size table and a chunk offset table are described by the media information part in each track in a movie resource portion (refer to drawing 4). [in the property track 62, the title track 63, the thumbnail track 64, and the intro MUJIKKU track 64], A sample size table describes the data size of the property data corresponding to each AV file, title data, the data of a thumbnail image, and the data of intro music, respectively.

[0049]That is, S11, S12, ..., S1n show the size of AV File #1, AV File #2, ..., the property data corresponding to AV File #n, respectively. S21, S22, ..., S2n show the size of AV File #1, AV File #2, ..., the title data corresponding to AV File #n, respectively. S31, S32, ..., S3n show the size of the data of AV File #1, AV File #2, ..., the thumbnail image corresponding to AV File#n, respectively. S41, S42, ..., S4n show the size of the data of the data of AV File #1, AV File #2, ..., the intro music corresponding to AV File #n, respectively.

[0050]Similarly, a chunk offset table describes the recording start byte positions, such as a property corresponding to each AV file, a title, data of a thumbnail image, and data of intro music, respectively. That is, O11, O12, ..., O1n show AV File #1, AV File #2, ..., the start byte position of the property data corresponding to AV File #n, respectively. O21, O22, ..., O2n show AV File #1, AV File #2, ..., the start byte position corresponding to AV File #n, respectively. O31, O32, ..., O3n show AV File#1, AV File #2, ..., the start byte position of the data of the

thumbnail image corresponding to AV File #n, respectively. O41, O42, ..., O4n show the start byte position of the data of the data of AV File #1, AV File #2, ..., the intro music corresponding to AV File #n, respectively.

[0051]It is supposed that it is possible to access exactly the property data corresponding to each AV file, title data, the data of a thumbnail image, the data of intro music, etc. in a movie data part by the above description.

[0052]Above-mentioned explanation outputs the data with which search is presented based on AV index file which has a movie resource portion and a movie data part. On the other hand, it is also possible to output the picture with which search is presented, a sound, etc. by directing the data stored in the movie data part in other index files by the file which consists only of a movie resource portion. In such a case, it attaches and explains below. As shown in drawing 13, AV Index File #1 which consists only of a movie resource portion with AV Index File #0 which has a movie resource portion and a movie data part is recorded. When the 0th bit is set to "1" in the flag field in the property data in AV Index File #0, The data entered is the file group or directory by which grouping was carried out (refer to drawing 8), and AV Index File #1 is directed here as a sauce portion corresponding to each live data in those file groups by which grouping was carried out, or a directory.

[0053]Some data in which AV Index File #1 is stored in the movie data part in AV Index File #0. For example, the data size for every AV file, a start byte position, etc. are described about property data, title data, and thumbnail image data as shown in drawing 13. AV Index File #1 can direct only the thing corresponding to a part of AV files among the data stored in the movie data part in AV Index File #0. Thus, it is made to output for search of only the part of the data of title data, thumbnail image data, intro music data, etc. stored, or processing of making only the thing corresponding to the part of the AV files on a recording medium output etc. is attained. It is supposed that it is possible to operate to search by this after a user etc. narrow down a retrieving range beforehand etc.

[0054]It is possible to also make description of the movie resource portion in the index file which has a movie resource portion and a movie data part correspond to the data stored in the movie data part in other index files. For example, when the 5th bit is set to "1" in the flag field in the property data in AV Index File #0, it is a case where it is supposed that the data of a thumbnail image exists in the file directed in the property track (refer to drawing 8). The file directed here is QT Movie File #1. This QTMovie File #1 has a movie resource portion and a movie data part, and the data of a thumbnail image and the usual image data are stored in the movie data part.

[0055]Thereby, it is supposed also under the form of files other than the form of an index file which was mentioned above that it is possible to treat the data at the time of search, and form of the file concerning search can be made more flexible. Although QT Movie File #1 stores the data of a thumbnail image in a movie data part, it may be made to store title data and the data of intro music in a movie data part. In this case, the 7th bit is set to "1", for example in the flag field in the property data in AV Index File #0.

[0056]As mentioned above, it is supposed by supposing that the data which the 0th bit is set to "1" and is entered in the flag field in property data is the file group or directory by which grouping was carried out that it is possible to treat data hierarchical. That is, as shown in drawing 14, index file AVIF0000.MOV which has a movie resource portion and a movie data part is treated as a root directory. Here into the movie resource portion of AVIF0000.MOV. The property data which were described by sample size and chunk offset and were stored in the

movie data part of AVIF0000.MOV by it, title data, the data of a thumbnail image, the data of intro music, etc. are directed.

[0057]In this case, AVIF0001.MOV as a low-ranking hierarchy's directory is directed by describing a file name by title data. Since AVIF0001.MOV also has the form of a QuickTime movie file, AV000001.MOV as other directories (further low rank) and AV000002.MOV** are directed by the description in property data. It is supposed by such a hierarchical file structure that it is possible to treat data hierarchical.

[0058]An index file is recorded on the position of the most-inner-circumference position 21 grade of the disk shape recording medium 20, as shown in drawing 15. And it is first reproduced at the time of the start of reproduction and edit mode, etc. Thereby, in the time of the start of reproduction and edit mode, etc., a retrieval picture as shown in drawing 2 is displayed. AV file general in other storage areas etc. are recorded.

[0059]It is made for one embodiment of this invention mentioned above to output the data for the search which relates to an index file using a display panel, a loudspeaker, etc. which are provided in the recorder. On the other hand, this invention can be applied also when operating reproduction, edit, etc. using the device of the exterior which outputs image data, audio information, etc.

[0060]This invention is generally applicable to the data for which it cannot depend on the compression encoding system at the time of recording image data, audio information, etc. for example, which can be treated under the form of a QuickTime movie file.

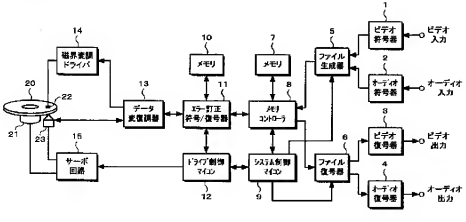
[0061]Various modification and application are possible for this invention within limits which are not limited to one embodiment etc. of this invention mentioned above, and do not deviate from the main point of this invention.

[0062]

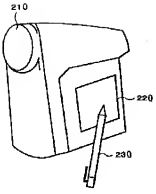
[Effect of the Invention]According to this invention, the extracted extract information concerning each of two or more files recorded on the disk shape recording medium is made to output, and desired data can be easily searched in relation to extracted extract information.

[0063]Therefore, in reproduction, editing operation, etc., the data made into the object of operation can be accessed easily, and operativity can be raised.

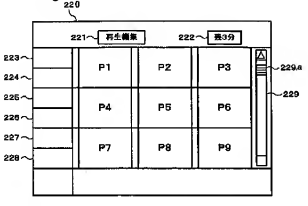
Drawing 1:



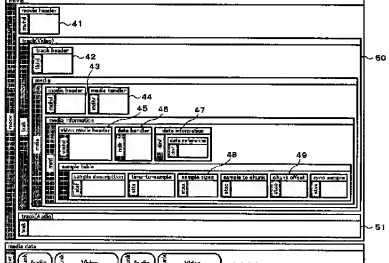
Drawing 2:



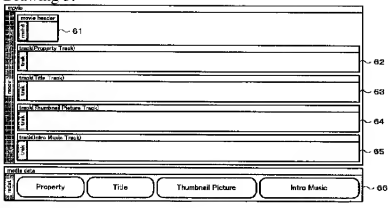
Drawing 3:



Drawing 4:



Drawing 5:



Drawing 6:

RBP	Length	Length
0	L_AP1	AV File Property #1
L_AP1	L_AP2	AV File Property #2
L_AP1+L_AP2	L_AP3	AV File Property #3
⋮	⋮	⋮
	L_APn	AV File Property #n

Drawing 7:

RBP	Length	Field Name
0	1	Version
1	2	Flags
3	1	Data Type
4	4	Creation Time
8	4	Modification Time
12	4	Duration
16	L_FI	File Identifier

Drawing 8:

Bit	Value	Description
0	0	Entryされているデータは、ファイルである。
	1	Entryされているデータは、グループ化されたファイル群またはディレクトリである。
1	0	AV Fileには、参照するファイルがない
	1	AV Fileには、参照するファイルがある
2	0	AV Fileには、タイトルが登録されていない
	1	AV Fileには、タイトルが登録されている
3	0	Titleのデータが AV Index Fileにある
	1	Titleのデータが Property データによって指示された AV Fileにある
4	0	AV Fileには、Thumbnail Picture 画像が登録されていない
	1	AV Fileには、Thumbnail Picture 画像が登録されている
5	0	Thumbnail Pictureのデータが、AV Index Fileにある
	1	Thumbnail Pictureのデータが、Property Trackで指示された AV Fileにある
6	0	AV Fileには、Intro Musicのデータが登録されていない
	1	AV Fileには、Intro Musicのデータが登録されている
7	0	Intro Musicのデータが AV Index Fileにある
	1	Intro Musicのデータが Property データで指示された AV Fileにある
Others		Reserved

Drawing 9:

RBP	Length	Field Name
0	L_AT1	AV File Title #1
L_AT1	L_AT2	AV File Title #2
L_AT1+L_AT2	L_AT3	AV File Title #3
⋮	⋮	⋮
	L_ATn	AV File Title #n

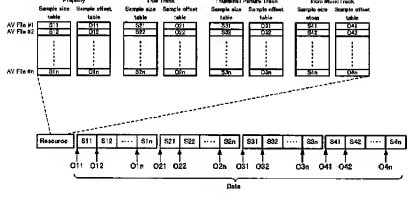
Drawing 10:

RBP	Length	Field Name
0	L_TH1	AV File Thumbnail Picture #1
L_TH1	L_TH2	AV File Thumbnail Picture #2
L_TH1+L_TH2	L_TH3	AV File Thumbnail Picture #3
⋮	⋮	⋮
	L_THn	AV File Thumbnail Picture #n

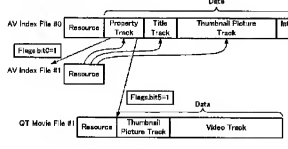
Drawing 11:

RBP	Length	Field Name
0	L_IS1	AV File Intro Music #1
L_IS1	L_IS2	AV File Intro Music #2
L_IS1+L_IS2	L_IS3	AV File Intro Music #3
⋮	⋮	⋮
	L_ISn	AV File Intro Music #n

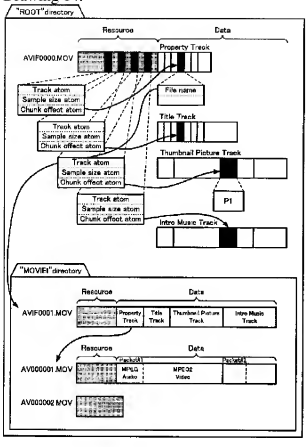
Drawing 12:



Drawing 13:



Drawing 14:



Drawing 15: